



## Illinois Department of Natural Resources

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Pat Quinn, Governor  
Marc Miller, Director

December 21, 2010

Mr. Tom Hickman  
McDonough County Highway Department  
204 S. Western Ave.  
Macomb, IL 61455

**RE: Element Power Cardinal Point Wind Farm, McDonough County  
Endangered Species Consultation Program  
EcoCAT Review #1008251**

Dear Mr. Hickman:

This proposed action was submitted to the Department by Element Power for consultation in accordance with the *Illinois Endangered Species Protection Act* (IESPA) [520 ILCS 10/11], the *Illinois Natural Areas Preservation Act* (INAPA) [525 ILCS 30/17], and Title 17 *Illinois Administrative Code* Part 1075.

This document is being submitted to you to become a part of any administrative record associated with a decision by the County to authorize the proposed wind farm facility.

This letter states the biological opinions of the Department of Natural Resources pertaining to Natural Areas and those endangered or threatened species protected by the statutes, identified above, which require the County's consultation with the Department. The Attachment to this letter states the Department's opinions and recommendations pertaining to those species covered by the *Fish and Aquatic Life Code* [515 ILCS 5] and the *Illinois Wildlife Code* [520 ILCS 5].

**Indiana Bat, *Myotis sodalis***. As demonstrated by documented fatalities of Indiana Bats at an Indiana wind farm in 2009 and 2010, this species is vulnerable to collision with utility-scale wind turbines. The project footprint contains no known hibernation sites (caves) for the Indiana Bat, a species listed as "endangered" by both the federal government and the State of Illinois, although potential roosting habitat is present in nearby woodlands associated with headwaters of the La Moine and Spoon Rivers.

Summer colonies of the Indiana Bat in McDonough County are inferred by captures of Indiana Bats on Camp Creek and Grindstone Creek, La Moine River tributaries in the southern part of the county, about fifteen miles south of the project, in 2002. Similar habitat on other La Moine tributaries closer to the project footprint may support undetected summer colonies.

A major winter hibernaculum of the Indiana Bat exists at the Blackball Mine, near the City of LaSalle, about 100 miles east-northeast of the project area. In fact, this Mine is the only federally-designated Critical Habitat for the Indiana Bat in Illinois. More than a thousand Indiana Bats winter there every year. The summer destinations of these bats and the migratory routes they follow are unknown. Minor hibernaculae exist in Adams County and Pike County, about 50 miles to the southwest, while summer colonies have been found in Henderson and Adams Counties.

Many Indiana Bats migrate significant distances, up to 300 miles, to their summer habitats. The historic range of this species includes all of Illinois, but in recent decades, records for the Indiana Bat exist only south of Interstate 80, with the northernmost records being in Henderson and LaSalle Counties, and in Northern Indiana.

Data from telemetry experiments with this species suggest they do not migrate in a straight line, although the characteristics of weather and terrain which may influence movements are not well-understood. The project area does not lie on a general line between any known hibernaculae and any known summer colony locations, and this may lessen the probability that this species occurs in the project footprint.

Element Power has collected additional evidence of bat activity in the project area through a program of acoustic monitoring. While this technology does not support definitive identification of the Indiana Bat, the percentage of all recorded bat calls of the genus *Myotis* was relatively low, and it is likely that most of those calls were emitted by more common members of that genus, such as the Little Brown Bat (*Myotis lucifugus*) and the Northern Long-Eared Bat (*Myotis septentrionalis*).

Based on existing information, it is the biological opinion of the Department the proposed action is unlikely to result in the taking of one or more Indiana Bats in the course of its service life, or to adversely modify its essential habitat. Please see the Attachment for additional important information about non-listed bats.

**Loggerhead Shrike, *Lanius ludovicianus*.** The State-listed threatened Loggerhead Shrike is adapted to the savanna conditions of interspersed grasslands, shrubs, and trees. This species has been adversely affected by the decline in animal husbandry and the abandonment of the "shelter-belt" fence-row conservation practice, which has severely reduced both breeding and foraging habitat. The Shrike, also known as the "butcher bird," needs thorny trees and shrubs, even barbed wire, on which to impale its prey, which may be left for several days before being eaten. Areas which support large insects and small rodents, major food items, are also necessary. Due to losses of suitable habitat, Loggerhead Shrikes may attempt reproduction in trees near homesteads, in cemeteries, and in other areas where they would normally not be expected.

The Shrike has been documented from several locations within 20 miles in the last 20 years, but some of these habitats have since been modified, and likely no longer support this species. However, they may make use of forest margins if an adequate hunting territory is associated with them. The species also has a statewide distribution so that migrants, as well as resident birds, may occur in the area.

Apart from migratory collisions, the main risk for wind energy facilities is thought to be the potential for further loss of remaining habitat, if trees are cleared to avoid wind turbulence or to improve turbine exposure, or if road-side trees are cleared to create turning radii for turbine carriers, or to establish power lines. Should such activities occur during the breeding season, the potential may exist for prohibited “taking” of nesting Shrikes. This species’ sensitivity to tall structures, visible motion, noise, shadow-flicker, and other turbine effects has not been studied, but these effects may have the potential to displace this species from otherwise suitable habitat.

Element Power has commissioned pre-construction avian activity surveys, in all seasons of the year, which did not identify any Loggerhead Shrikes. While this does not exclude the possibility of Shrikes occurring in any given season, it does suggest that risks to this species from this project may be low.

Based on existing information, it is the biological opinion of the Department the proposed action is unlikely to adversely modify the essential habitat of the Loggerhead Shrike.

**Upland Sandpiper, *Bartramia longicauda*.** This species has been recorded from numerous locations within the project footprint, extending into Warren County, both by Departmental and contracted observers. Although traditionally regarded as a grassland bird, in recent years the species has often been documented nesting in grassed waterways and in no-till corn and soybean fields. Clearly, the absence of large grassland blocks does not guarantee the absence of this species. Surveys commissioned by Element Power identified Upland Sandpipers throughout the central portions of the project area, while earlier observations by Department staff were largely to the southeast of the recent observations. Together, these observations demonstrate this species is likely to be found throughout the project area.

The Upland Sandpiper arrives in North American breeding areas in late April and May and departs again by mid-August. Brooding occurs in late May and June, with juveniles able to fly by late July.

While this species is not noted for its sensitivity to vertical structures, it may be displaced from essential habitat due to the near presence of turbines, or the flickering shadows they cast. If turbines are built when the birds are absent, it is possible the birds will find these habitats unsuitable when they return. However, in one Illinois location, Upland Sandpipers have been reported to persist in nesting at the same location within a wind farm for three consecutive years following construction, which suggests they may tolerate turbines if available habitat is limited, although the specific attributes of the relationship between this nesting site and the nearby turbines are not known.

This species may be at risk of blade-strike mortality, since the mating ritual includes acrobatic aerial displays which occur at about the same height as blade rotation.

The construction of access roads, land-lines, substations, and turbines during the mating and rearing season has the potential to “take” this species through the inadvertent destruction of nests

and the unintentional harassment of adults, which may more often resort to "distress" behaviors (the well-known "broken wing" decoy defense) to protect their nesting sites.

These birds may also be subjected to increased predation pressure since there is evidence that meso-predators, including coyotes, quickly learn to scavenge beneath wind turbines for the carcasses of birds and bats killed by collisions. Habitual scavenging is likely to increase the opportunities for discovering nests and killing Sandpiper chicks and adults.

It is the biological opinion of the Department the proposed action is likely to adversely affect the essential habitat of this species through its displacement or exclusion from habitat which was formerly available, and to take the species through inadvertent nest-destruction or blade collision.

*Recommendation #1. The Department recommends that Element Power seek and obtain an Incidental Take Authorization pursuant to 520 ILCS 5.5 and Part 1080 for the Upland Sandpiper.*

*Recommendation #2. The Department recommends spring/summer breeding surveys for the Upland Sandpiper prior to construction activities, and the restriction of construction in and near potential breeding habitat during the portion of the year the species may be present in McDonough County.*

*Recommendation #3. Construction workers should be trained to recognize the appearance and behavior of the Upland Sandpiper and instructed to avoid or to discontinue activities which may "take" them, and to report potential sightings.*

*Recommendation #4. Post-construction studies should determine whether Upland Sandpipers continue to nest within the wind farm, and, if so, to monitor and report their behavior relative to the nearest turbines.*

*Recommendation #5. If studies demonstrate reduced recruitment of Upland Sandpipers due to factors related to the wind farm (collision mortality, predation, displacement, etc.), Element Power should devise and implement suitable mitigation actions to restore or improve juvenile recruitment for this species. Such actions could include identification and preservation or restoration of suitable habitat nearby, predator control programs, and other measures.*

**Lined Snake, *Tropidoclonion lineatum*.** Listed as "threatened" by Illinois in 2004, the Department has records for this species from just nine locations throughout the State, only two of which are from non-urban locations. This may reflect the fact that there are far more potential observers in urban areas than that the snake is largely restricted to urban sites.

A road-killed specimen was found within the footprint of the wind farm in the Town Fork watershed, about a mile northwest of Good Hope, in October 2001, thus establishing that a population of this species is present within the footprint. The size and extent of this population have never been investigated, nor has it been established the population remains extant. Nor has

there ever been an investigation of whether other isolated populations of this animal exist elsewhere in the footprint or in McDonough County.

The Lined Snake is a small snake, rarely reaching a length of 12 inches, with a body diameter similar to that of a pencil. An adult can easily be mistaken for an immature Garter Snake unless the belly scales can be examined. Each belly scale possesses two half-moon black markings, sometimes described as looking like dark sunglasses or a ladder. This marking is exclusive to the Lined Snake; no other species has a similar marking.

This animal feeds almost entirely on earthworms and other soft invertebrates found in soil and plant litter, and it is believed to have evolved in moist prairie grasslands where such prey was abundant and soils were not compacted. It has a fossorial or semi-fossorial habit, rarely appearing on the surface except after heavy rains, and it spends significant time under cover, whether rocks, logs, or other debris. These characteristics and its small size may account in large degree for the rarity of observations and why most reports are from urban areas no longer subject to mechanized agriculture.

Being small, it is vulnerable to many natural enemies, including other snakes, as well as birds and mammals. It mates in the fall (August or September). Consequently the movements of individuals in search of mates may peak about the same time of year. It gives birth to live young a year later, which may be only four or five inches long. It spends the winter in subsurface locations below the frost line.

These habits and characteristics render the Lined Snake potentially vulnerable to wind farm construction and operation in a number of ways. It may be crushed or entombed by vehicles; it may be injured or killed by excavation or trenching equipment. The construction of new access roads may fragment remaining habitat and populations. It probably would not be bothered by flicker, being below ground much of the time during the day, but it may be directly sensitive to the noise or vibration of operating turbines, or indirectly sensitive should its primary prey prove sensitive as well. In addition, the possible effects of electromagnetic fields (EMF) surrounding buried power lines on either the Lined Snake or its prey are unknown. Ground current (stray voltage), although never intended, can sometimes occur near high-voltage installations and would have a direct adverse effect on ground-dwelling animals such as the Lined Snake.

It is the biological opinion of the Department the proposed action is likely to adversely affect the essential habitat of the Lined Snake, and is likely to harass, injure, or kill one or more individuals.

*Recommendation #6. The Department recommends that Element Power seek and obtain an Incidental Take Authorization pursuant to 520 ILCS 5.5 and Part 1080 for the Lined Snake.*

*Recommendation #7. Element Power should avoid disturbing untilled land, including road ditches and grassed waterways, wherever possible, to minimize any potential direct taking of the Lined Snake.*

*Recommendation #8. Element Power should commission extensive surveys, using appropriate methods, to determine the size and extent of populations of the Lined Snake in the vicinity of the project to better evaluate the potential impact to the statewide population of this species of its proposed operations.*

*Recommendation #9. Construction workers should be trained to recognize the Lined Snake, and instructed to avoid or discontinue activities which may take them, and to report potential sightings.*

*Recommendation #10. Element Markets should commission research on the responses, if any, of this species and its primary prey to noise, ground vibration, EMF, or ground current associated with operating wind turbines.*

**Regal Fritillary, *Speyeria idalia*.** This threatened butterfly has been observed in the Sciota Railroad Prairie INAI Site, Thistle Hills Land & Water Reserve, and other scattered prairie remnants in McDonough and adjacent counties. In order for successful reproduction to occur, the eggs of this species must be laid in a tallgrass prairie natural community containing one or more species of violet. [For many years Birdfoot Violet was thought to be the exclusive food host for the caterpillars of this species, but now more than eight violet species have been documented as supporting larval feeding.]

The species has an unusual life history. The sexes are dimorphic, males having a discernibly different wing pattern than females. Adult males also emerge in early to mid-June, several weeks before the females, with the flights of the two genders overlapping only for about two weeks in late June or early July, when mating occurs. However, females do not lay their eggs immediately after fertilization, instead entering an extended period of arrested egg development known as “diapause” until September, when egg-laying begins. During this period, the female faces the challenge of surviving for weeks on the nectar of flowering plants, something once easy to do in extensive prairies, but much more difficult when such systems are small, widely scattered, and often lacking a diversity of flowering species.

This species is classed as a strong flyer, with flights claimed in excess of 20 miles.

Unfortunately, the females are indiscriminate egg-layers, depositing a few eggs on any plant which offers a perch, unlike most species which lay eggs directly on the larval food host. After a few days, the eggs hatch, and the first-instar larvae drop to the ground and seek shelter for the winter, but eat nothing. Not until spring do larvae seek the nearest violet and begin to feed, but only if any violets can be found and if the larva survives so long. There are many predators and diseases which can attack dormant larvae, to say nothing of fire and bad weather.

Overenthusiastic or uninformed stewardship practices on remaining prairies using prescribed fire have undoubtedly reduced or eliminated some populations.

Fortunately, the Regal Fritillary is a prolific egg-producer, with each female laying ten thousand eggs or more, so that at least a few offspring are likely to reach maturity. But “few” is the key word; even a “stronghold” of this species, such as the Nachusa Grassland in Lee County, may produce only about 50 pairs annually. Many documented breeding locations produce less than a dozen.

It is possible that Regal Fritillaries at Sciota RR Prairie may represent “strays” rather than breeders. But, if so, they are straying from somewhere nearby, and so remain worthy of notice and caution.

The Regal Fritillary is vulnerable to the destruction of larvae through the use of off-road vehicles and encroachment on, or the destruction of, tallgrass plant communities, through excavation or wildfire. Adults are susceptible to collisions with vehicles and, possibly, turbine blades. Whether larvae or adults (or their predators) may have a negative response to flicker is unknown.

It is the biological opinion of the Department the proposed action is likely to adversely modify the essential habitat of the Regal Fritillary Butterfly through the construction of access roads which may infringe on its breeding or nectaring habitat and through the creation of obstacles which create a risk of collision.

*Recommendation #11. Element Power should identify and map potential breeding and nectaring habitat within the project footprint and in the vicinity. The essential elements for breeding habitat are tallgrass prairie communities containing violet species, and grasslands containing prairie forbs which flower from July through September for nectaring habitat.*

*Recommendation #12. Potential breeding habitats should be surveyed for the presence of Regal Fritillary larvae or adults. Any site where adults are observed should be more closely examined the following year for caterpillars, especially if the observed adults include males.*

*Recommendation #13. Construction workers should be trained to recognize male and female Regal Fritillaries, and be instructed to report sightings and to discontinue any activities which may be harmful to the butterflies or to their habitat.*

*Recommendation #14. Sites where adult Regal Fritillaries are observed should be evaluated for the risks turbine construction or operations may pose to butterflies using such habitat.*

**Bunchflower, *Melanthium virginicum*.** Although once widespread in Illinois, of the thirteen documented locations of this threatened plant species identified in the last 25 years, over half are in McDonough County. Two lie within the footprint of this project.

Sometimes called the Virginia Bunchflower, this plant is a member of the lily family, although its flowers are not lily-like. Like lilies, it develops a large fibrous tuber, which can sustain its growth for many years without seed production, and allows it to survive disturbances like burning and mowing. Although a mature plant can reach heights over four feet, it can require ten years or more from seed to reach such a size. When in flower (late May, June, July, early August), its large flower stalk crowned by bunches of small white flowers command attention. When not in flower, it is more easily missed. Not every plant in a population will flower in a given year. For example, the population at Sciota RR Prairie (see below) numbered over one thousand plants in 2003, but only about fifty were in flower. This plant can become suppressed in a plant community undisturbed for years, but seems to thrive with periodic fire disturbance. Mowing, on the other hand prevents flowering and seed production.

The Bunchflower is usually found in moist mesic prairies, and is generally classed as facultative for wetlands. The second location within the footprint, in Section 3, consisted of a single flowering plant observed in a grassed waterway draining to the East Fork of the La Moine River. This discovery is illustrative of the ability of this plant to persist in an agricultural landscape.

Plants are vulnerable to harm during the construction of a wind farm from activities such as excavation of foundations, trenching of power cables, alteration of hydrology through the disruption of drain tiles or the construction of access roads.etc. Plants may be indirectly affected if the operation of wind turbines alters animal behaviors affecting plants (pollination, herbivory, etc.).

Under Illinois law, wild plants are the property of the land owner; and it is unlawful for any person to “take” a plant without the written consent of the land owner [520 ILCS 10/3]. The Department’s role is to enforce violations of the law. Consequently, where a population of state-listed plants is known to exist, or may be present, it behooves persons who may harm a plant in any way to obtain the written permission of the land owner to do so. A lease which does not directly address this issue is not deemed to constitute a valid authorization to take a plant.

It is the biological opinion of the Department the proposed action is unlikely to adversely modify the essential habitat of the Bunchflower, but an inadvertent taking may be possible.

*Recommendation #15. Element Power should map locations within the project area where the Bunchflower may be encountered, and avoid disturbing such areas if possible.*

*Recommendation #16. Element Power should examine known or likely habitats to identify and census plants of this species, for the purposes of avoiding harm to them and, potentially, working towards their conservation.*

*Recommendation #17. If Bunchflowers may be harmed in any way through activities supporting this project, Element Markets should obtain specific written authorization from the respective land owners to take this species, and assure copies of such authorizations are in the possession of any personnel performing such activities when they are implemented.*

*Recommendation #18. Construction workers should be trained to recognize the Bunchflower, both with and without flower stalks, and instructed to report any previously unidentified plants and to cease potentially harmful actions until instructed to proceed.*

*Recommendation #19. If plants of this rare species are damaged or destroyed through the activities of Element Markets, with or without the consent of their owners, Element Markets should take steps to mitigate the losses through conservation of the plant, translocation of genetic materials to other suitable locations, restoration of existing plant populations, or through the preservation and enhancement of other remaining McDonough County Bunchflower populations.*



**Colmar Isopod, *Caecidotea lesliei*.** This small (10 mm) segmented crustacean was first described to science in 1981 (Lewis & Bowman), based on ten individuals collected from a field tile outlet south of Colmar, McDonough County, in 1941, and preserved at the Smithsonian National Museum. Four more individuals were collected from the same field tile in 2001 by the Illinois Natural History Survey, proving its continued existence.

The Colmar Isopod is known from no other location in McDonough County, in Illinois, or in the World. So far as is known, this animal is endemic to the immediate vicinity of Colmar. Because it is known from only one location, it has been listed as “endangered” by the Illinois Endangered Species Board.

The Colmar Isopod is described as a “phreatobite,” a creature which occupies the saturated interstices of soils and is sometimes found in wells, springs, and tiles, as opposed to one which occupies caves (“troglobite”) or one found at or just below the soil surface (“epigean”). Its diet likely consists of bacteria and organic matter carried downward by infiltrating water. The Colmar Isopod has survived the evolution of typical farming practices in the vicinity.

As a phreatobite, this Isopod is seldom in a position to be observed by humans unless it is flushed from field tiles or appears in well water. Should someone take note of such a small creature (only the males reach 10 mm), there are few scientists capable of recognizing the species on sight; analysis of particular anatomical characteristics is necessary to distinguish it from other members of the genus. To complicate matters, immature specimens may not have developed some of the identifying marks. These factors militate against identification by untrained observers. Local residents may be completely unaware of this unique species’ existence.

Scientists have been unable to discern any unique aspect of Colmar’s geology, hydrology, or biology which would explain a limitation of this species to such a small locale. Other members of the genus are widespread through Illinois’ soils, and this should be true of *C. lesliei*, as well. Scientific opinion holds that these species did not exist beneath ice sheets but were easily able to colonize hundreds of miles of soils exposed by glacial retreat. Consequently, it is possible the Colmar Isopod is present within the proposed footprint, nearby to the north within the watershed of the La Moine River, and having soils with a similar geological and biological development.

Clearly the proposed wind farm poses no threat to the type-locality near Colmar. But, because this species occupies the soils at depths consistent with field tiles, if the species is present within the project, then excavations for turbine foundations will extend past the depths at which it would be active, carrying it to the surface, where it may not survive.

Discovery of the species within the project would be a significant event; this would imply its numbers are much higher than now believed. But such a discovery will not immediately change its listing status, and direct disturbance of its habitat would constitute a legally-prohibited incidental taking of the species. As with other fossorial and subterranean species described in this letter, it is difficult to predict its response to noise, ground vibration, and EMF associated with underground power lines.

It is the biological opinion of the Department that, if the species is present, the proposed action is likely to adversely modify the essential habitat of the Colmar Isopod and to result in its incidental taking.

*Recommendation #20. In view of the uncertainty regarding its presence, the Department recommends Element Power perform surveys for the Colmar Isopod by sampling tile outlets or soil borings throughout the project area and submitting them to qualified scientists for analysis. If members of this species are found, the Department and the Endangered Species Board should be consulted further on appropriate steps to be taken.*

**Sciota Railroad Prairie INAI Site.** The Sciota RR Prairie is located along the section boundary between Sections 30 and 31, extending westward along the old railroad corridor for three-quarters of a mile from the eastern Section corner, about three-quarters of a mile west of the Village of Sciota. At one time a high-quality mesic prairie community, the Site has suffered from lack of appropriate management. It is noted as having, at one time, a large population of the State-listed threatened **Bunchflower**, and the threatened **Regal Fritillary**, whose reproduction on the Site has not been confirmed. Like other RR Prairies, it can provide an important refuge for many prairie-community species of both plants and animals, especially in the winter, when migratory raptors, particularly the **Short-Eared Owl**, roost and hunt in them. Its contingent of reptiles may include the threatened **Lined Snake**.

Although many wind turbines will be visible from the INAI Site, the ability to visualize pre-settlement conditions is not a characteristic preserved by INAI status. The INAI Site could be adversely affected if any infrastructure construction takes place within its limits, or if turbines are constructed close enough for their operation to potentially affect the behavior of INAI Site animals through effects such as flicker, noise, and vibration.

As it happens, Sciota RR Prairie INAI site is located within a natural gas storage area where a utility (Ameren) temporarily stores natural gas in underlying geologic formations. The utility considers high-voltage electrical generators and their supporting infrastructure a risk to safe operation of its facility, and has requested a 1,500-foot setback of any wind farm components from its injection/withdrawal wells. Element Power's observance of this request will have the benefit of providing a setback of at least that distance for most for the INAI Site. However, depending on the size of the selected turbines, this is not necessarily beyond the range of flicker, noise, and vibration from the wind farm that animals within the INAI Site may experience.

The incidence, duration, and intensity of these effects are dependent on the bearing and distance of the turbine from the area of concern. Distance decreases both duration and intensity, while bearing determines whether the incidence of flicker is even possible, as well as whether and where vibrations from multiple sources produce interference or amplification. The Department believes that simply observing the 1,500-foot setback requested by the utility will not assure that the INAI Site does not receive some impacts from turbines in the area. While such flicker, if any, will be of short duration and low-intensity, it may occur at times of the year (the solstices) and times of day (dawn/sunset) which are more important in terms of both annual and daily biological cycles. Long-term low-intensity sound or vibration may render the site less hospitable for some species.

*Recommendation #21. The Department recommends that turbines within 1.8 miles of the Sciota RR Prairie INAI Site be situated in such a way that their bearing toward the INAI Site will not permit flicker within the site boundaries.*

*Recommendation #22. Sciota RR Prairie INAI Site should be one of the locations within the project footprint surveyed for the presence of the Lined Snake. If this species is present, an acoustic analysis of low-frequency sound/vibration based on proposed turbine locations may be warranted.*

*Recommendation #23. Element Power should consider entering additional agreements with the land owner(s) of Sciota RR Prairie to promote appropriate natural areas management which will conserve and enhance the resource value of the Site to the Bunchflower and the Regal Fritillary, as well as other plants and wildlife.*

**Thistle Hills Land & Water Reserve and INAI Site.** This Land & Water Reserve, northwest of the City of Macomb, lies just beyond four miles south of the project area. Comprised of a few hill prairies adjacent to wooded ravines, this location supports the **Regal Fritillary** and the recently de-listed Hill's Thistle, *Cirsium hillii*.

Much of the Site lies below an elevation of 700 feet above mean sea level (msl), which is about the elevation of the hill prairies. Although much of the wind farm is on higher land above 750 feet msl, the hill prairies are surrounded by woodlands, so that it is unlikely that at this distance any wind turbines will be visible from within the Reserve, and those few that may be will not be obtrusive. The main significance of Thistle Hills to this proposed action stems from the essential habitat it provides to listed species, bats, and migratory birds.

It is the biological opinion of the Department the proposed action is unlikely to adversely modify the Thistle Hills Land & Water Reserve and INAI Site.

**Argyle Hollow Barrens Nature Preserve and INAI Site.** This 15-acre Nature Preserve is nestled near the center of Argyle Lake State Park, about five miles due south of the project area. Due to topography, the wind farm will not be visible from any part of the Nature Preserve, and the Preserve lies well beyond the reach of any other effect produced by wind turbines. The significance of Nature Preserve to the project is that it is part of the larger forested habitat provided by the Park, which provides essential habitat for migratory birds and bats which may have interactions with the wind farm. The presence of Argyle Lake may enhance the Park's attractiveness to bats.

It is the biological opinion of the Department the proposed action is unlikely to adversely modify the Argyle Hollow Barrens Nature Preserve and INAI Site.

**Short Fork Seep Nature Preserve and INAI Site.** Short Fork Seep, a 48-acre privately-owned Nature Preserve, is located three miles due east of Good Hope, and thus about three miles east of the wind farm. The Site is notable for a high-quality seep natural community and lesser quality marsh and shrub-swamp communities, and it is bisected by Short Fork Creek, which drains the

eastern portions of the wind farm. About half of the INAI Site lies outside the western boundary of the Nature Preserve and is controlled by a different private owner.

Short Fork Seep is the focus of a long-term research project on fauna of the *Lepidoptera* family (moths and butterflies). Located mainly in the creek valley, the Preserve includes the south-facing north slope of the valley, which supports second-growth forest and formerly-grazed pasture, which includes a number of thorny trees and shrubs, including Osage Orange and several species of Hawthorns.

Due to the topography, which provides fairly high and steep valley walls, turbines within the project area are unlikely to be visible from within the Nature Preserve or INAI Site, except for those due west of the Preserve, since that is the axis of the Short Fork valley, providing a longer perspective. However, since that is also the direction of Good Hope, few if any turbines may be constructed on that bearing, and so should not be obtrusive to Nature Preserve visitors. The Site and Preserve lie beyond the reach of other potential effects, such as flicker and noise.

The major significance of the Site and Preserve to the wind farm project is the essential habitat it may provide to endangered or threatened species. Although none have been reported, this may be due to a lack of sustained observation or intensity of effort. The Site provides suitable habitat for the threatened **Lined Snake**, observed just a few miles to the west, and four other species of snakes have been reported. Among birds breeding in the Preserve is the Yellow-Billed Cuckoo, a close relative of the threatened **Black-Billed Cuckoo**, and the combination of natural communities and former pasture with thorny tree species provides ideal habitat for the endangered **Loggerhead Shrike**. Bur Oaks and Osage Orange trees provide bat roosting habitat.

An unusual number of larger mammalian predators have been reported from the site, including Coyote, Red Fox, Badger, and Mink, as well as squirrels, ground squirrels, and smaller rodents, which along with several species of amphibians provides an abundant food resource. Of the Fritillary butterfly group, only the threatened **Regal Fritillary** is missing from the Site's Lepidopteran inventory. Hence, the Preserve and INAI Site may provide a location which could facilitate research on the extent of the populations of endangered or threatened species likely to be adversely affected for the proposed wind farm. Appropriate permits from the Illinois Nature Preserves Commission and the Preserve's owners would be needed for any such research.

Because the Reserve is bisected by Short Fork Creek, which drains portions of the wind farm, there is some potential for the LWR to be adversely modified by any degradation of water quality related to wind farm construction and operation, which in turn could adversely modify the seep and marsh communities. Scrupulous observance of NPDES construction requirements should be sufficient to protect against such degradation.

It is the biological opinion of the Department the proposed action is unlikely to adversely modify the Short Fork Seep Nature Preserve and INAI site.

Please review the Attachment for additional important information. Consultation on the part of the Department is terminated, unless the County desires additional information or advice related

to this proposal. In accordance with 17 Ill. Adm. Code 1075.40(h), McDonough County must notify the Department of its decision regarding these recommendations, whether it will:

- Allow the action to proceed as originally proposed;
- Require the action to be modified per Department recommendations (please specify which measures if not all will be required); or
- Forgo the action.

This consultation is valid for two years unless new information becomes available which was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary.

The natural resource review reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, the applicant must comply with the applicable statutes and regulations. Also, note that termination does not imply IDNR's authorization or endorsement of the proposed action.

Please contact me if you have questions regarding this review.

Sincerely,



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cc: Jenny Skufca, Illinois Nature Preserves Commission  
Gina Wolf, Element Power, Inc.  
Bill Poole, NRC/Stantec

Attachment

## ATTACHMENT

### Element Power Inc. Cardinal Point Wind Farm McDonough County

Pursuant to the Department's authority to conserve and to protect the fauna and flora of Illinois, the following information is provided about possible impacts to non-listed species and important conservation resources that are or may be found in the area. In certain instances it also provides recommendations for the consideration of the County and the developer.

**Avian Wildlife.** The construction of large-scale wind farms has implications for a broad range of wildlife; it may result in increased mortality, fragmentation of essential habitats, and displacement of important life-cycle activities, such as feeding and nesting. To assess the effects of such facilities, it is imperative to establish a base-line of wildlife presence and activity within and near the proposed facility to which later conditions may be compared in order to discern how they may have been affected by the wind farm or other human modifications of the area. The Department notes that Element Power has implemented the following recommendation with respect to pre-construction surveys.

*Recommendation #A1. The Department recommends pre- and post-construction assessments of avian usage within the project area. Consideration of all seasons should be included, but particularly migratory seasons. Such studies should include mapping of habitats within and adjacent to the project footprint, and consideration should be given to periodic repetition of such studies during the life of the project to detect/monitor significant shifts in wildlife usage.*

**Bats.** Although the Indiana Bat is currently the only federally-listed or state-listed bat believed to occur in or near McDonough County, other bat species are abundant in the area. Consultation looks at cumulative risk to species, and the high bat mortality that can be found at some wind farms coupled with the westward movement of White-Nose Syndrome suggests increasing threats to bat species in Illinois. The Department notes that Element Power has implemented an excellent pre-construction acoustic survey for bat activity.

In anticipation of the arrival of White Nose Syndrome (WNS), Wisconsin recently listed four additional species of bats, all of which are present at Cardinal Point. Illinois is awaiting the results of investigations of winter hibernaculae in early 2011 before deciding what measures should be taken in response to WNS. The four species newly listed by Wisconsin are: **Northern Long-Eared Bat** (*Myotis septentrionalis*), **Little Brown Bat** (*Myotis lucifugus*), **Big Brown Bat** (*Eptesicus fuscus*), and the **Tricolor Bat** (*Perimyotis subflavus*) formerly known as the **Eastern Pipistrelle**.

*Recommendation #A2. The Department recommends the applicant perform at least one fall migration season (July-October) of acoustic bat monitoring to assess the level of bat activity within and through the project footprint. The Department recommends consideration of a requirement to periodically repeat, perhaps on a five-year cycle, monitoring activities in order to detect significant shifts in bat species or abundance. The use of full-spectrum acoustic*

*equipment offers an improved opportunity to identify the species of bats present without also conducting mist-net sampling. If acoustic monitoring indicates a high level of bat activity, further assessment is appropriate, including mist-net studies and telemetry studies to confirm species identification and roosting locations. At a minimum, high levels of pre-construction bat activity should prompt post-construction mortality studies.*

**American Golden Plover, *Pluvialis dominica*.** The Golden Plover is a migratory shore-bird with a relatively low global population (<300,000) which breeds in the Arctic and winters in the Caribbean and South America. Its southward course is along the Atlantic Seaboard, but its northward route is through the Central United States, with important staging areas in Illinois and Indiana. Staging habitat typically consists of former prairies, now converted to corn and soybean agriculture, which also contain ephemeral spring-season wetlands, which are later farmed. Several weeks are spent resting and feeding at such locations before resuming the northward migration. Staging areas are critical to the birds arriving at the breeding grounds in prime reproductive condition. From one year to another, areas used for staging may vary by several hundred miles; factors causing such shifts are not understood.

The initial concern for this species was that its flocking and flight habits might result in significant collision mortality. But recent studies in Indiana and Illinois strongly suggest this species is sensitive to vertical structures and habitat fragmentation, seldom being observed on the ground closer than 70 meters from roads and buildings. The Fowler Ridge wind farm in Benton County, IN, hosted upwards of 25,000 Golden Plovers prior to wind farm construction, but a recent census reported by WEST, Inc., found only around 250 birds, none of which were observed any closer to a wind turbine than 400 meters. This strongly suggests the Golden Plover is intolerant of wind turbines and at low risk of collision.

Considering the setbacks from existing roads and farmsteads which are normally required, the combined effect of the construction of wind turbines and their supporting infrastructure may be to nearly totally exclude the Golden Plover from habitat within a wind farm. Studies in Scotland of a very closely-related species have reached similar conclusions. Thus, displacement and exclusion from essential staging habitat appears to be the most important impact to this species from wind energy development.

Such conclusions are preliminary, but alarming, considering the expected proliferation of wind energy technology across the landscape, their cumulative effects, and the apparent correlation between areas with high wind resources and Golden Plover staging habitat.

A very high percentage of the proposed project area contains good Golden Plover staging habitat: open corn and soybean fields containing farmed wetlands. The pre-construction surveys commissioned by Element Power observed several substantial flocks of Golden Plovers using the project area. While the project area may not prove as important to this species as other regions of the State, it may still have a significant effect.

On the basis of existing information, it is the biological opinion of the Department the proposed action is likely to have an adverse impact on the American Golden Plover.

*Recommendation #A3. In addition to the standard avian migratory surveys, which are usually done before the Plovers arrive, a special assessment of site usage by the American Golden Plover should be performed. Typically, migration staging occurs in late April and early May. If more than 1,000 birds are present, the site will satisfy the criterion for a “State Important Bird Area.” Should this condition occur, the assessment should be extended beyond the limits of the wind farm to determine the extent to which suitable staging habitat exists in the area and is being used.*

*Recommendation #A4. If significant numbers of American Golden Plovers are found to use the area, then a post-construction assessment of Plover use should be performed to test whether this species is indeed excluded or displaced by wind turbine presence. If this result is confirmed, mitigation of the loss of habitat is warranted. Appropriate mitigation might consist of obtaining wind development rights on other suitable Plover habitat for the purpose of protecting such areas from additional wind development.*

**Aviation Warning Lights.** Turbines more than 200 feet high are required by the Federal Aviation Administration to have flashing warning lights to warn aviators of potential collision hazards. Usually, flashing red lights are used, which most researchers agree are less likely to attract night-flying migratory birds than are flashing white lights or steady red lights. This does not eliminate collision risk caused by lighting, however.

The light flashes are typically synchronized across a wind energy facility, so that all lit turbines flash together. In overcast conditions, red light is reflected from the cloud deck back to the ground. This may have the effect of altering the behavior of nocturnal terrestrial wildlife, whose visual organs are typically adapted to low light or spectra in the infrared or ultraviolet ranges. Flashing illumination may affect the relationship between predators and prey, by either enhancing or interfering with the ability to detect prey or predators. Possible nearby wind facilities will have similar lighting, whose cumulative effects may further confuse birds.

It is the biological opinion of the Department the proposed action is likely to result in nocturnal migrant bird mortality due to intermittent illumination from aircraft warning lights.

*Recommendation #A5. To minimize the adverse effects of intermittent illumination, a wind farm should be equipped with an FAA-approved Audio-Visual Warning System (AVWS) so that warning lights operate ONLY when approaching aircraft are at risk of collision with a wind turbine, and remain off under other circumstances.*

**Northern Harrier, *Circus cyaneus*.** The State-listed endangered Northern Harrier is a ground-nesting grassland hawk. The species has a statewide range. While many sources indicate the species needs large open areas of habitat, Illinois studies have demonstrated this hawk can use relatively small patches of habitat for successful breeding, especially in the vicinity of larger habitats. Breeding is often associated with wetlands such as marshes, sedge meadows, and wet prairies.

While most hunting activities occur at fairly low altitudes, below typical rotor-swept elevations, hunting can expose this bird to collision risk. This species engages in an aerial courtship display



which places it at risk of collision with wind turbines. Wind farm construction and operation may alter concentrations of prey species. This hawk relies heavily on its acute hearing to locate prey; if the noise generated by wind turbines interferes with this function, turbines might adversely affect their ability to hunt near the turbines, reducing available food resources.

Post-construction avian surveys of other wind farms have noted the absence of Northern Harriers which were previously present, suggesting that migrant Harriers may avoid operating wind turbines. The major effect on this species may be displacement or exclusion from previously-available hunting habitat. The pre-construction survey commissioned by Element Power observed only one migrant Harrier in the vicinity of the proposed wind farm, suggesting that even if Harriers are displaced, the effect of this proposed action may not be significant.

It is the biological opinion of the Department the project is unlikely to adversely affect the essential habitat of the Northern Harrier.

**Bald Eagle, *Haliaeetus leucocephalus*.** Although de-listed by both the federal and Illinois governments, this species remains protected by two federal laws, the *Migratory Bird Treaty Act* and the *Bald and Golden Eagle Protection Act*. Illinois has been experiencing a strong population increase, suggesting that Eagles will be occupying much new territory. Spring Lake and Argyle Lake offer potential habitat in the vicinity of the project.

The Department is aware of a case in Ontario of a juvenile Bald Eagle colliding with a wind turbine. Juvenile birds may be more vulnerable to collision, and it is also possible that construction of wind turbines may affect the selection of new nesting sites or the use of existing nests. Bald Eagles typically forage over streams, lakes, and ponds. Eagles are not limited to river corridors during migratory flights. A number of Bald Eagle nests are present along the Mississippi river 15 miles to the west, and along the Illinois River 36 miles to the east.

It is the biological opinion of the Department the project, at present, is not likely to jeopardize the Bald Eagle or to adversely affect its essential habitat.

**Argyle Lake State Park.** This IDNR-owned facility is located about five miles south of the proposed project footprint and includes a lake, a campground, and the **Argyle Hollow Barrens Nature Preserve**. Due to the height of the proposed turbines and the relative elevations of the respective sites, turbines in the project will be clearly visible only from a few acres of the extreme northern portions of the Park, which are maintained as crop fields and grasslands. From all other areas within the Park the project will be screened by trees and topography. The Department anticipates no adverse effects to recreational uses of the Park related to the proposed wind farm.